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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,712	07/25/2003	Teruo Maeda	116672	1898

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EXAMINER	
PHAM, HAI CHI	
ART UNIT	**PAPER NUMBER**
2861	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No.	Applicant(s)	
	10/626,712	MAEDA ET AL.	
	Examiner	Art Unit	
	Hai C. Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-23* is/are pending in the application.

4a) Of the above claim(s) *12 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11 and 23* is/are rejected.

7)☒ Claim(s) *13-15 and 17-22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita (JP 6-67102) in view of Ishida et al. (JP 63-14331).

Tomita discloses an optical scanning device comprising a semiconductor laser (1), a circuit board (5) on which the semiconductor laser is mounted, a deflector (polygon mirror 32) for deflecting a laser beam emitted from the semiconductor laser, an image forming optical system (scanning lenses 22 and 23) for forming an image on a photosensitive member (46) by the laser beam deflected by the deflector, and an optical box (7) having an attachment face (e.g., bottom face) to which the circuit board is attached (the drive circuit board 5 along with the holding assembly for holding the laser and the collimator lens 2 is attached to the bottom face of the optical box 7 via the screw 8 and the sets of pins 7a-b and slots), wherein an outgoing direction of the laser beam of the semiconductor laser is along the circuit board (the optical axis of the laser beam being parallel to the drive circuit board 5 and to the bottom face of the optical box 7), and the optical axis of the semiconductor laser is adjusted by moving the circuit board along the attachment face (the optical box 7 is provided with pins 7a

and 7b such that the holding assembly along with the drive circuit board 5 can be moved in the direction of the optical axis of the laser beam to thereby adjust the optical axis of the laser beam).

Tomita further teaches the semiconductor laser including a light emitting device having three leads and exposing the photosensitive located outside the optical box, but fails to teach the elastic member holding the lead frames.

Ishida et al. discloses a fixing device for a semiconductor laser (1) wherein the semiconductor laser is fitted into the hole of the laser holder (2) and a plate (3) having spring pawls (11a-11c) is used to further press the semiconductor in the optical axis direction such that semiconductor is not turned if the ambient temperature changes (see Abstract)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Tomita with the elastic member in the form of the spring pawl as taught by Ishida et al. for the purpose of stabilizing the semiconductor laser even if the ambient temperature changes as suggested by Ishida et al.

Tomita further teaches:

- an optical axis adjustment in an optical axis direction of the laser beam and a main scanning direction is made by moving the circuit board along the attachment face (the holding assembly and thus the drive circuit board 5 are adjustly movable in the optical axis direction and main scanning direction),

- an optical axis adjustment of an outgoing angle in a plane including the main scanning direction of the laser beam is made by moving the circuit board along the attachment face (the outgoing angle of the laser beam being parallel to the main scanning plane),
- the deflector includes a rotary polygon mirror (46);
- the semiconductor laser includes an exposed light emitting device (e.g., does not include a cover glass of a light beam outgoing window) and three leads.

3. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of Ishida et al., as applied to claim 3 above, and further in view of Mogi (U.S. 5,490,158).

Tomita, as modified by Ishida et al., discloses all the basic limitations of the claimed invention except for the laser having three leads, which are disposed within one plane, being disposed within a center portion in a direction of the circuit board, and at an end in a direction of the circuit board.

Mogi discloses an optical scanning device comprising a semiconductor laser (2), a circuit board on which the semiconductor laser is mounted (base member 8 supporting the driver IC 6 and the semiconductor laser 2), a deflector (polygon mirror 31) for deflecting a laser beam emitted from the semiconductor laser, an image forming optical system (scanning lens 32) for forming an image on a photosensitive member (not shown) by the laser beam deflected by the deflector, and an optical box (optical box 36) having an attachment face to which the circuit board is attached (the

laser unit being attached to the mount base forming the optical box 36), wherein an outgoing direction of the laser beam of the semiconductor laser is along the circuit board (the optical axis L is parallel to the driver IC 6 and its mount base 8) (Fig. 3). Mogi further teaches the semiconductor laser having leads in one plane, the semiconductor laser being at the center portion of the circuit board and at an end in the direction of the circuit board (Fig. 3).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Tomita by providing the laser/circuit board unit as taught by Mogi. The motivation for doing so would have been to provide a compact and integral laser unit.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of Ishida et al., as applied to claim 1 above, and further in view Yanagisawa (JP 2000-249957).

Tomita, as modified by Ishida et al., discloses all the basic limitations of the claimed invention except for the elastic member for elastically holding the semiconductor laser, and an angle member for making an adjustment of one direction of the optical axis of an outgoing beam from the semiconductor laser.

Yanagisawa discloses an optical scanner comprising a light source having a semiconductor laser (42) fixed to the holding member (46), which can be displaced by turning the adjusting screw (54) so as to perform aligning adjustment in the direction of the optical axis.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Tomita with the elastic holding member as taught by Yanagisawa for the purpose of adjusting the alignment of the laser unit in the optical axis direction.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of Ishida et al., as applied to claim 2 above, and further in view of Itabashi (U.S. 6,469,772).

Tomita, as modified by Ishida et al., discloses all the basic limitations of the claimed invention except for the optical axis adjustment in a sub scanning direction of the laser beam is made by moving the semiconductor laser with respect to the circuit board.

Itabashi discloses a laser light source unit for an optical scanning device, wherein an angle adjusting device in the form of a wedge-like-shaped member (18), a flat-surfaced cam (19) or a screw (20) is provided for adjusting the angle of the optical axis of the laser beam with respect to the optical box (17) in the sub-scanning direction such that a deviation of the optical axis of the laser beam in the sub-scanning direction is corrected (Figs. 7A-7D) (col. 8, line 11 through col. 9, line 20).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Tomita with the angle adjusting device as taught by Itabashi for the purpose of adjusting the optical axis of the laser

beam in the sub-scanning direction to correct for a deviation of the optical axis of the laser beam in the sub-scanning direction as suggested by Itabashi.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Ishida et al. and Yanagisawa, as applied to claim 5 above, and further in view of Mogi et al. (U.S. 6,992,690).

Tomita, as modified by Ishida et al. and Yanagisawa, discloses all the basic limitations of the claimed invention except for the two bosses for attaching the circuit board and screwing the circuit board to the bosses.

Mogi et al. ('690) discloses an optical scanning device comprising an optical box (8) provided with two bosses, one boss (11c) and the second one facing the circuit board (11a), which is fixed to the second boss of the optical box via screw (14) (Fig. 11B).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the optical box in the device of Tomita with the two bosses as taught by Mogi et al. ('690) for the purpose of fixedly attached the circuit board to the optical box.

Allowable Subject Matter

7. Claims 13-15 and 17-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Pertinent Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Komatsu (US 5,774,248) and Kato et al. (US 5,351,264) each discloses using an elastic member to stabilize the semiconductor laser, which is press fitted in the laser holder.

Response to Arguments

9. Applicant's arguments with respect to claims 1-9, 11 and 23 have been considered but are moot in view of the new grounds of rejection.

10. In anticipation that the same arguments would be directed by the applicant toward the newly cited reference in Ishida et al. in combination with Tomita, the examiner respectfully notes that Applicant's arguments filed 04/05/07 are not persuasive.

Applicant argued that "the semiconductor of Tomita is press fit for the immobilization together of the semiconductor laser and the collimator lens" such that it would not further require the elastic member of Miura. The examiner respectfully disagrees. The semiconductor laser is press fit so as to be immobilized against the laser holder during the assembly when the ambient temperature has no effect on the apparatus. However, during the printing operation, the laser heats up and the ambient temperature becomes far higher than that at the production line, and due to the

difference of thermal expansion between the semiconductor laser and the fitting device, the semiconductor laser eventually becomes loose and may turn within its holder as described by the newly cited reference in Ishida et al., which proposes to incorporate the plate with a spring pawl to stabilize the semiconductor laser preventing the laser to turn when the ambient temperature increases.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hai Phan

HAI PHAM
PRIMARY EXAMINER

June 16, 2007